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ऊन की बारीकी श्रेणियाँ  
(दूसरा पुनरीक्षण)

**Fineness Grades of Wool**  
( Second Revision )

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भारतीय मानक ब्यूरो  
BUREAU OF INDIAN STANDARDS  
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI - 110002  
[www.bis.gov.in](http://www.bis.gov.in) [www.standardsbis.in](http://www.standardsbis.in)

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## FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wool, Wool Products and Textile Floor Coverings Sectional Committee had been approved by the Textiles Division Council.

It is sometimes very difficult to correctly determine the fineness of wool on the basis of fibres taken out from the yarn/fabric which has undergone processing during spinning, weaving and finishing.

Due to wide variation in the fineness parameters of imported wool and indigenous wool, the fineness values of these have been specified separately. Further, the grades finer than 48s have not been specified for indigenous wool as the same are not yet available on a commercial scale.

The terms 'grade' as used in this standard, should not be confused with the terms 'quality' and 'type'. 'Quality' is a term that includes not only fineness but also characteristics, such as length, character, strength, elasticity, lustre and colour, all of which affect the spinnability of wool and the properties of the yarn and fabric produced from the wool. 'Type' is a term designating a particular combination of characteristics appropriate to a specific use of descriptive of geographic origin, breed of sheep or preparation for market. Further, the Bradford designations which use the same grade designations, for example, 54 s and 50 s, as are used in this standard, refer to the quality and not only to fineness.

This standard was first published in 1970. The first revision was undertaken in 1977 to modify the specifications of indigenous wool in respect of average fibre diameter and the standard deviation. The confidence limit of the average fibre diameter was also amended in this revision.

The present revision has been made in the light of experience gained since last revision and to bring the standard in latest format, incorporate the Amendment No. 1 and to update the referred standards.

The composition of the committee responsible for the formulation of this standard is listed in Annex A.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.

*Indian Standard*  
**FINENESS GRADES OF WOOL**  
*( Second Revision )*

## 1 SCOPE

**1.1** This standard covers the classification of fineness grades of the fibres in raw wool.

**1.2** This standard is also applicable to wool yarns and fabrics processed on the woollen system. However, the test results obtained on the wool fibres removed from yarns and fabrics may not meet the specifications as given in the standard which are for raw wool. If these meet the specifications of the next coarser grade, the same shall be considered as satisfying the requirements.

## 2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below.

<i>IS No.</i>	<i>Title</i>
IS 744 : 2000	Textiles — Methods for determination of wool fibre diameter, percentage of medullated fibres and kemp fibre ( <i>third revision</i> )

## 3 TERMINOLOGY

For the purpose of this standard, 'grade' shall be a descriptive term used in rating of wool based on fineness, that is, average diameter and variation, that is, standard deviation of fibre diameter (or fibre width).

## 4 GRADES

The specifications for various grades of imported and indigenous wool are given in Table 1.

## 5. METHOD OF TEST

**5.1** Determine the diameter of wool fibres by the method given in IS 744. The number of observations

to be made for this purpose shall be such as to obtain confidence limits of the mean within  $\pm 1.0 \mu\text{m}$  at a probability level of 95 percent.

**5.1.1** The number of fibres to be observed in order to attain the above stated confidence limits of the mean shall be determined by the following formula, which, however, shall not exceed 1 000:

$$n = \left( \frac{t \sigma}{E} \right)^2$$

where

$n$  = number of fibres;

$t$  = probability factor (1.96 for 95 percent probability level);

$\sigma$  = standard deviation of fibre diameter; and

$E$  = desired precision of the mean, that is,  $\pm 1.0 \mu\text{m}$ .

NOTE — An example illustrating the calculation of the total number of observations, is given below:

On observing the diameter of 200 fibres, the standard deviation is found to be 14.25 microns. The number ( $n$ ) of fibres to be tested shall be:

$$n = \left( \frac{1.96 \times 14.25}{1.0} \right)^2 = 780$$

**5.2** Calculate the average fibre diameter and standard deviation.

## 6. ASSIGNMENT OF GRADE

**6.1** Compare the average fibre diameter and standard deviation in fibre diameter as determined in 5.2, with the specifications for various grades given in Table 1. Assign to the wool the grade that corresponds to the observed average fibre diameter and standard deviation. If the measured average fibre diameter and standard deviation corresponds to a single grade, assign that grade to the wool. If the standard deviation exceeds by two grades lower than that specified for grade to which observed fibre diameter corresponds, assign to the wool the next coarser grade. In case the standard deviation further exceeds then no grade is to be assigned for having used heterogeneous/improperly graded wool rendering the material unsuitable for the desired purpose.

**6.1.1** A few examples illustrating the assignment of grade are given below:

<b>Imported Wool</b>		<b>Indigenous Wool</b>	
<i>Example 1</i>		<i>Example 4</i>	
Average fibre diameter	24.24 $\mu\text{m}$	Average fibre diameter	34.15 $\mu\text{m}$
Standard deviation	6.21 $\mu\text{m}$	Standard deviation	13.12 $\mu\text{m}$
Assigned grade	60s	Assigned grade	48s
<i>Example 2</i>		<i>Example 5</i>	
Average fibre diameter	31.23 $\mu\text{m}$	Average fibre diameter	34.15 $\mu\text{m}$
Standard deviation	8.72 $\mu\text{m}$	Standard deviation	14.23 $\mu\text{m}$
Assigned grade	48s	Assigned grade	44s
<i>Example 3</i>		<i>Example 6</i>	
Average fibre diameter	31.23 $\mu\text{m}$	Average fibre diameter	37.23 $\mu\text{m}$
Standard deviation	9.30 $\mu\text{m}$	Standard deviation	15.91 $\mu\text{m}$
Assigned grade	46s	Assigned grade	40s

**Table 1 Specifications for Grades of Wool**  
(Clauses 4.1 and 6.1)

Sl No.	Grade	Imported Wool		Indigenous Wool	
		Range for Average Fibre Diameter  µm	Standard Deviation, <i>Max</i> µm	Range for Average Fibre Diameter µm	Standard Deviation, <i>Max</i> µm
(1)	(2)	(3)	(4)	(5)	(6)
i)	Finer than 80s	Under 17.70	3.59	-	-
ii)	80s	17.70 to 19.14	4.09	-	-
iii)	70s	19.15 to 20.59	4.59	-	-
iv)	64s	20.60 to 22.04	5.19	-	-
v)	62s	22.05 to 23.49	5.89	-	-
vi)	60s	23.50 to 24.94	6.49	-	-
vii)	58s	24.95 to 26.39	7.09	-	-
viii)	56s	26.40 to 27.84	7.59	-	-
ix)	54s	27.85 to 29.29	8.19	-	-
x)	50s	29.30 to 30.99	8.69	-	-
xi)	48s	31.00 to 32.69	9.09	Under 34.40	13.50
xii)	46s	32.70 to 34.39	9.59	-	-
xiii)	44s	34.40 to 36.19	10.09	34.41 to 36.20	14.75
xiv)	40s	36.20 to 38.09	10.69	36.21 to 38.60	16.25
xv)	36s	38.10 to 40.20	11.19	38.61 to 40.80	18.00
xvi)	Coarser than 36s	Over 40.20	-	Over 40.81	-

**ANNEX A**  
(Foreword)

**COMMITTEE COMPOSITION**

Wool, Wool Products and Textile Floor Coverings Sectional Committee, TXD 04

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SCIENTIST 'B'/ASSISTANT DIRECTOR  
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## BUREAU OF INDIAN STANDARDS

### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones: 2323 0131, 2323 3375, 2323 9402

Website: [www.bis.gov.in](http://www.bis.gov.in)

### Regional Offices:

	Telephones
Central : 601/A, Konnectus Tower -1, 6 <sup>th</sup> Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	{ 2323 7617
Eastern : 8 <sup>th</sup> Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	{ 2367 0012 2320 9474
Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	{ 265 9930
Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	{ 2254 1442 2254 1216
Western : Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	{ 2821 8093

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